**Amendments to the Drawings**:

The attached sheets (1/3 and 2/3) of drawings, marked "Replacement Sheet" in the top margin thereof, include changes to Figures 1 and 2, respectively. These sheets replace the previously filed sheets (1/3 and 2/3).

Attachments: Replacement Sheets (Sheets 1/3 and 2/3).

## Remarks

Claims 2-14 are pending.

Claim 1 is canceled, without prejudice.

Claim 2 has been rewritten in independent form to recite the limitations of former Claim 1. Claim 2 has also been amended to particularly point out and distinctly claim Applicant's invention. Claim 2 recites that the trip unit produces the thermal trip and the magnetic trip independent of the monitor. See, for example, page 6, lines 21-22 of the specification ("the microcontroller 39 is not utilized in generating any of the trips").

Claim 6 has been amended to change its dependency from Claim 1 to Claim 2.

Claim 9 has been rewritten in independent form to include the limitations of Claims 1, 6 and 7.

Two attached Replacement Sheets (1/3 and 2/3) of drawings are attached. "Replacement Sheet" 1/3 includes reference numeral 29 for the "GROUND FAULT" circuit. See, for example, page 4, lines 20-22 of the specification. "Replacement Sheet" 2/3 includes reference signal, Ref, in the surge detection circuit 65. See, for example, page 5, lines 26-29 of the specification.

The specification has been amended at page 1, lines 24-30 to correct two inadvertent typographical errors.

The specification has been amended at page 6, line 26 through page 7, line 9, in order to recite element 85 of Figure 3.

One independent claim was previously canceled; one independent claim is canceled, without prejudice; and two claims are rewritten in independent form. It is submitted that no fee is due. If any fee is due, please charge it to Deposit Account No. 05-0275. Duplicate copies of pages 1, 9 and 16 of this Amendment are enclosed.

## OBJECTIONS TO THE DRAWINGS UNDER 37 CFR 1.84(p)(5)

The Examiner objects to the drawings on the ground that element 29 is not included, and that element 85 is not described in the specification.

Drawing sheet 1/3, as marked "Replacement Sheet" in the top margin thereof, replaces Figure 1 and includes reference numeral 29 for the "GROUND FAULT" circuit.

The specification has been amended to recite element 85 in the paragraph at page 6, line 26 through page 7, line 9.

Therefore, it is submitted that the drawings and the specification pass muster under 37 CFR 1.84(p)(5).

**REJECTIONS UNDER 35 U.S.C. § 103(a)**

The Examiner rejects Claims 2-4 as being unpatentable over U.S. Patent No. 6,239,677 (Ramakrishnan et al.) in view of U.S. Patent Application Publication No. 2003/0202304 (Canova et al.).

Ramakrishnan et al. discloses a molded case circuit breaker 9 including an operating mechanism 10, a pair of electrical contacts 142 and 162, a thermal-magnetic trip unit 22, and a position indicators 120,122. The overcurrent indicator 120 carries a first flag (overcurrent flag) 132 and senses the bimetallic force applied on a bimetal 84 which is heat sensitive. To identify a trip caused by a short circuit condition, the short circuit indicator 122 carries a second flag (short circuit flag) 134 and senses the magnetic force applied to an indicator of a trip bar system. The overcurrent indicator 120 and flag 132 are viewable through a window 124 for indicating a tripped position which occurs when the current path is interrupted in response to a trip event caused by overheating. When a short circuit event has occurred, only the second flag 134, and not the first flag 132, is visible from the window 124 of the case 11.

Canova et al. discloses (Figure 1) an electronic circuit breaker 1 including a block 3 which contains the series combination of a current-read resistor 4, a fuse 5 and an electronic switch (MOSFET) 7. The resistor 4 "reads" the current that traverses the circuit breaker 1 and that supplies a load Z. A limitation block 9 includes an operational amplifier 11 connected to the electronic switch 7. In the event of overcurrent to the load Z (*i.e.*, in the event of the current exceeding a pre-set limit value), the limitation block 9, by means of the operational amplifier 11, sends the MOSFET 7 of the block 3 into a condition of partial inhibition within 300 microseconds or even less. The voltage across the current-read resistor 4 is applied to the inputs of an operational amplifier 25, the output of which is connected to the microprocessor 13, which thus receives a signal that is proportional to the current flowing through the resistor 4.

As shown with reference to Figure 2 of Canova et al., after a programmable delay time, the microprocessor 13 goes into action, by means of the output voltage on the pin 33 as sent to the individual amplifiers 11 of the blocks 3A, 3B, 3C through outputs x. This sends the individual MOSFETs 7 into a state of inhibition, thus reducing the current to a tripping value. The microprocessor 13 also acts on the blocks 3, causing inhibition of the switch 7 in the case of overheating, which is detected by the resistor 17. The resistor 17 varies with temperature and is thermally coupled to the components of the circuit breaker 1 that are subject to overheating.

Claim 2, as amended, recites, *inter alia*, a circuit breaker comprising: separable contacts; an operating mechanism opening the separable contacts when actuated; a trip unit comprising a thermal/magnetic trip device producing a thermal trip by actuating the operating mechanism in response to persistent overload conditions and producing a magnetic trip by actuating the operating mechanism in response to overcurrent conditions; and a monitor providing a thermal trip indication when the separable contacts are opened by the thermal trip and providing a magnetic trip indication when the separable contacts are opened by the magnetic trip. The trip unit produces the thermal trip and the magnetic trip independent of the monitor. The thermal/magnetic trip device comprises a bimetal heated by current passing through the separable contacts. The monitor comprises a trip sensor sensing opening of the separable contacts, a temperature sensor sensing temperature of the bimetal, a processor generating a thermal trip signal in response to a sensed temperature above a selected value when the separable contacts open, and output means generating the thermal trip indication in response to the thermal trip signal.

The Examiner states that Ramakrishnan et al. does not disclose a temperature sensor sensing temperature of a bimetal, and a processor generating a thermal trip signal in response to a sensed temperature above a selected value when the separable contacts open, and output means generating a thermal trip indication in response to such thermal trip signal. For this structure, the Examiner relies upon paragraphs 13 and 27 of Canova et al. which provide (emphasis added) in part that:

> [0013] [t]he use of a microprocessor enables a plurality of functions and advantages to be achieved. In particular, the delay in intervention of the switch, which brings about complete inhibition or interruption of the circuit breaker (the so-called "tripping"), and the value of the current that causes opening of the circuit by the circuit breaker are programmable and may possibly be modified also remotely by means of an input/output terminal of the microprocessor and a serial port.

Also, in paragraph 39, Canova et al. states that the microprocessor acts on the block 3 (Figure 1), causing inhibition of the switches 7 also in the case of overheating, which is detected by the resistor 17, which is temperature-variable.

Claim 2 recites that the monitor comprises a trip sensor sensing opening of the separable contacts, a temperature sensor sensing temperature of the bimetal, a *processor generating a thermal trip signal* in response to a sensed temperature above a selected value ***when the separable contacts open***, and output means generating the thermal trip indication in

response to the thermal trip signal, and that the ***trip unit produces the thermal trip and the magnetic trip independent of the monitor***.

Even if Ramakrishnan et al. could be combined with Canova et al., although this is not admitted, it is submitted that this could not be accomplished by one of ordinary skill without great difficulty. Furthermore, it is submitted that Canova et al., which teaches that the microprocessor 13 receives a signal that is proportional to the current flowing (*i.e.*, a condition of partial inhibition) through the current-read resistor 4, and which employs the microprocessor 13 to act on the blocks 3 to cause inhibition of the MOSFET switch 7, teaches away from the refined recital of a processor of a monitor generating a thermal trip signal in response to a sensed temperature above a selected value ***when*** separable contacts ***open***, and output means generating a thermal trip indication in response to a thermal trip signal, in combination with a trip unit producing a thermal trip and a magnetic trip ***independent of*** such monitor. Ramakrishnan et al., which discloses no temperature sensor and no processor generating a thermal trip signal, adds nothing to Canova et al. in this regard.

For the above reasons, Claim 2 patentably distinguishes over the references.

Claims 3 and 4 depend directly or indirectly from Claim 2, include all of the limitations thereof, and patentably distinguish over the references for the same reasons.

Furthermore, Claim 3 recites that the monitor further comprises an overcurrent sensor sensing current through the separable contacts, that the processor generates a magnetic trip signal in response to a sensed current signal above a selected value when the separable contacts open, and that the output means generates the magnetic trip indication in response to the magnetic trip signal.

As to Claim 3, the Examiner states that "the claim is interpreted and rejected as claim 2 stated above. It would have been obvious to use the microprocessor to also control the magnetic trip and indication related to the magnetic trip because the microprocessor would already be controlling the temperature control and indication."

It is submitted that Canova et al., which teaches that the microprocessor 13 receives a signal that is proportional to the current flowing (*i.e.*, a condition of partial inhibition) through the current-read resistor 4, and which employs the microprocessor 13 to act on the blocks 3 to cause inhibition of the MOSFET switch 7, teaches away from the refined recital of a processor of a monitor generating a magnetic trip signal in response to a sensed current signal above a selected value ***when*** separable contacts ***open***, and output means generating a magnetic trip indication in response to a magnetic trip signal, in combination with a trip unit producing a thermal trip and a magnetic trip ***independent of*** such monitor.

Ramakrishnan et al., which discloses no overcurrent sensor sensing current and no processor generating a magnetic trip signal, adds nothing to Canova et al. in this regard.

For the above reasons, Claim 3 further patentably distinguishes over the references.

Claim 4 is not separately asserted to be patentable except in combination with Claims 2 and 3, from which it depends.

The Examiner rejects Claim 5 as being unpatentable over Ramakrishnan et al. in view Canova et al. and further in view of U.S. Patent No. 5,038,246 (Durivage, III).

Durivage, III discloses a circuit breaker tripping system 100 including a microcomputer 120 that sends identical tripping system status information to a local display 150 and a display terminal 162. The information is sent synchronously on a serial peripheral interface 191 to the local display 150 and asynchronously on a serial communication interface 151 to the display terminal 162. The interfaces 151 and 191 may be implemented using the SCI and SPI ports internal to the microcomputer 120. The history of the tripping system status information is stored in a nonvolatile trip memory 144. That history includes the specific cause and current level of the last trip and a running accumulation of the different trip causes.

It is submitted that Durivage, III adds nothing to Ramakrishnan et al. and Canova et al. to render Claim 2 unpatentable.

Claim 5 is not separately asserted to be patentable except in combination with Claims 2 and 3, from which it depends.

The Examiner rejects Claims 6 and 7 as being unpatentable over Ramakrishnan et al. in view of U.S. Patent No. 6,552,884 (Kim et al.).

Kim et al. discloses a circuit breaker including a ground fault detector 104, an arc fault detector 106, an overload detector 108, trip circuitry 110 and display circuitry 112. If an arc fault has occurred, the arc fault detector 106 generates a first trip signal and transmits it to the trip circuitry 110 and the display circuitry 112. If a ground fault has occurred, the ground fault detector 104 generates a second trip signal and transmits it to the trip circuitry 110 and the display circuitry 112. The overload detector 108 determines if an overload has occurred by measuring the current flowing on the phase conductor and if an overload has occurred, the overload detector 108 generates the third trip signal and transmits it to the trip circuitry 110 and the display circuitry 112. The trip circuitry 110 disconnects a phase conductor in order to separate a source 100 from a load 102 when the trip circuitry 110 receives a trip signal from one of the arc fault detector 106, ground fault detector 104 and

overload detector 108. The display circuitry 112 displays the cause of the disconnection of the phase conductor when the phase conductor is disconnected on account of the trip signal generated by one of the ground fault detector 104, the arc fault detector 106 and the overload detector 108. The display circuitry 112 displays the cause of the disconnection by lighting a light emitting diode (LED) or a digital display.

It is submitted that Kim et al. adds nothing to Ramakrishnan et al. and Canova et al. to render Claim 2 unpatentable.

Claims 6 and 7 are not separately asserted to be patentable except in combination with Claims 2 and 6 from which Claims 6 and 7, respectively, depend.

The Examiner rejects Claim 8 as being unpatentable over Ramakrishnan et al. in view of Kim et al. and further in view of Japanese Patent JP405300617A (Miwa).

Miwa discloses a circuit breaker wherein a surge sensor or voltmeter detects an abnormal surge during opening/closing and raises an alarm.

It is submitted that Miwa adds nothing to Ramakrishnan et al., Kim et al. and Canova et al. to render Claim 2 unpatentable.

Claim 8 is not separately asserted to be patentable except in combination with Claims 2, 6 and 7, from which it depends.

The Examiner rejects Claims 9 and 10 as being unpatentable over Ramakrishnan et al. in view of Kim et al. further in view of Canova et al..

It is submitted that Kim et al. and Canova et al. add nothing to Ramakrishnan et al. to render Claim 3 unpatentable.

Claim 9, as amended, is an independent claim which recites, *inter alia*, that the ***trip unit produces the thermal trip and the magnetic trip independent of the monitor***, and that the monitor comprises a trip sensor sensing opening of the separable contacts, a temperature sensor sensing the temperature of the thermal magnetic trip device, an overcurrent sensor sensing current above a selected value through the separable contacts, a processor generating a thermal trip signal in response to the temperature secured by the temperature sensor above a selected value ***when*** the trip sensor senses opening of the separable contacts, generating a magnetic trip indication with the current of the overcurrent sensor above a selected value ***when*** the trip sensor senses opening of the separable contacts, generates an arc fault trip signal in response to an arc fault signal from the arc fault circuit ***when*** the trip sensor senses opening of the separable contacts, generates a ground fault trip signal in response to a ground fault signal from the ground fault circuit ***when*** the trip sensor senses opening of the separable contacts, and output means generating the thermal trip

indication in response to the thermal trip signal, the magnetic trip indication in response to the magnetic trip signal, an arc fault trip indication in response to the arc fault trip signal, and a ground fault trip indication in response to the ground fault trip signal.

Claim 9 patentably distinguishes over the references for similar reasons as were discussed above in connection with Claims 2 and 3.

Claim 10 is not separately asserted to be patentable except in combination with Claim 9 from which it depends.

The Examiner rejects Claim 11 as being unpatentable over Ramakrishnan et al. in view of Kim et al. further in view of Canova et al. and further in view of Durivage, III.

It is submitted that Kim et al., Canova et al. and Durivage, III add nothing to Ramakrishnan et al. to render Claim 9 unpatentable.

Claim 11 is not separately asserted to be patentable except in combination with Claim 9 from which it depends.

The Examiner rejects Claims 12-14 as being unpatentable over Ramakrishnan et al. in view of Kim et al. further in view of Canova et al. and further in view of U.S. Patent No. 5,351,038 (Goldberg).

Goldberg discloses a circuit breaker locator 10 including contacts 12a,12b connected within a housing 11 to a fuse 20 which would normally be approximately 50 amps. A warning light 25 is connected to the contacts 12a,12b to light if the circuit breaker fails to operate. In some cases circuit breakers become frozen or inoperative and the light 25 gives notice of this fact when the replaceable fuse 20 blows. The fuse 20 may be readily replaced by merely removing a cover 13.

It is submitted that Kim et al., Canova et al. and Goldberg add nothing to Ramakrishnan et al. to render Claim 9 unpatentable.

Claim 12 is not separately asserted to be patentable except in combination with Claim 9 from which it depends.

Claim 13 is not separately asserted to be patentable except in combination with Claims 9 and 12, from which it depends.

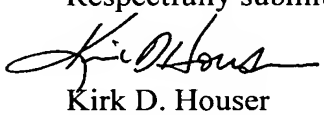
Claim 14 is not separately asserted to be patentable except in combination with Claims 9 and 10, from which it depends.

**Summary and Conclusion**

The prior art made of record and not relied upon but considered pertinent to Applicant's disclosure has been reviewed. In summary, it is submitted that Claims 2-14 are patentable over the references of record.

Reconsideration and early allowance are requested.

Respectfully submitted,



Kirk D. Houser
Registration No. 37,357
Attorney for Applicant

(412) 566-6083